The thesis focuses on segmentation of images with leaves of woody species. The main aim was to investigate existing image segmentation methods, choose suitable method for given data and implement it. Inputs are scanned leaves and photographs of various quality. The thesis summarizes the general methods of image segmentation and describes algorithm that gives us the best results. Based on the histogram, the algorithm decides whether the input is of sufficient quality and can be segmented by Otsu algorithm or is not and should be segmented using GrowCut algorithm. Next, the image is improved by morphological closing and holes filling. Finally, only the largest object is left. Results are illustrated using generated output images.